

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	§	
Paul Nicholls	§	Group Art Unit: 2855
	§	
Serial No.: 10/530,502	§	
	§	Examiner: Verbitsky, Gail Kaplan
Filed: August 21, 2006	§	
	§	
For: A Vessel Having Temperature Monitoring Apparatus	§	Atty Docket: 101.0057
	§	
	§	
Assistant Commissioner for Patents Washington, D.C. 20231		
Assistant Commissioner:		

APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 41.31 AND 41.37

This Appeal Brief is being filed in furtherance to the Notice of Appeal filed on June 15, 2010.

1. **REAL PARTY IN INTEREST**

The real party in interest is Schlumberger Technology Corporation, the Assignee of the above-referenced application by virtue of the Assignment recorded at reel 017838, frame 0567.

2. **RELATED APPEALS AND INTERFERENCES**

Previously, a Notice of Appeal was filed in the present case (via Certificate of Mailing on October 8, 2009) and an Appeal Brief was filed in support of the October 8, 2009 Notice of Appeal (via Certificate of Mailing on December 1, 2009). The Examiner attempted to reopen prosecution of the present application with the Office Action mailed March 18, 2010, and the June 15, 2010 Notice of Appeal was then filed. Appellants are unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellant's legal representative in this Appeal. Schlumberger Technology Corporation, the Assignee of the above-referenced

application as evidenced by the documents listed above, will be directly affected by the Board's decision in the pending appeal.

3. **STATUS OF CLAIMS**

Claims 1-7, 9-16, 18, 20-31 were finally rejected by the Examiner as of the final Office Action dated July 7, 2009. (Claims 1-7, 9-16, 18 and 20-31 were again rejected in the March 18, 2010 Office Action mailed after the December 1, 2009 Appeal Brief.) Claims 8, 17, 19 were canceled without prejudice prior to the final Office Action dated July 7, 2009. The rejection of claims 1-7, 9-16, 18, 20-31 is appealed.

4. **STATUS OF AMENDMENTS**

The most recent amendment was in a Reply and Amendment, filed under certificate of mailing on April 8, 2009, in which claim 1 was amended. However, no amendments have been filed after the final Office Action dated July 7, 2009.

5. **SUMMARY OF THE CLAIMED SUBJECT MATTER**

a.) Independent Claim 1

Independent claim 1 is directed to a vessel (2) which comprises a body (4), a conduit (6), and a distributed temperature system (12). The conduit (6) is disposed near the body (4), and the distributed temperature system (12) comprises an optical fiber (14) positioned in the conduit (6) to monitor temperature in the body (4). (*See, for example, page 4, line 14-24*). The vessel (2) also comprises a control unit (50). (*See, for example, page 8, lines 2-4*). Additionally, vessel (2) comprises a tray (22), an outlet weir (24), and a downcomer (26) positioned within the body (4). The conduit (6) and optical fiber (14) extend such that they provide a temperature profile of temperatures in at least a portion of the body (4) containing the tray (22), outlet weir (24), and downcomer (26). (*See, for example, page 5, lines 4-17 and page 6, lines 11-17*). A process is performed within the vessel (2) and the control unit (50) automatically controls parameters in the body (4) depending on the temperature profile to ensure that the process is within an acceptable range. (*See, for example, page 8, lines 2-24*).

b.) Independent Claim 18

Independent claim 18 is directed to a method for monitoring a vessel (2). The method comprises disposing a conduit (6) near a body (4) of the vessel (2) and monitoring temperature in the body (4) by use of a distributed temperature system (12) which includes an optical fiber (14) located within the conduit (6). (*See, for example, page 4, line 14-24*). The method further comprises extending the conduit (6) and the optical fiber (14) so they provide a temperature profile of temperatures in at least a portion of the body (4). (*See, for example, page 5, lines for-13*). The method further comprises automatically controlling parameters in the body (4) according to the temperature profile obtained by the distributed temperature system (12). (*See, for example, page 8, lines 2-24*).

6. **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

a.) Whether claims 1, 7, 11 and 13-15 are unpatentable under 35 U.S.C. § 112, second paragraph.

b.) Whether claims 18, 20, 23, 25 and 30-31 are unpatentable under 35 U.S.C. § 102(b) as anticipated by the Iida et al. reference, US Patent No.: 5,356,220.

c.) Whether claims 1-5, 10 and 16 are unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference, in view of the DeBruin reference, US Patent Application Publication No.: 2008/0312406.

d.) Whether claims 6-7 are unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference and the DeBruin reference, in view of the Hartog et al. reference, US Patent No.: 5,821,861.

e.) Whether claims 21-22 are unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference, in view of the Hartog et al. reference.

f.) Whether claims 24 and 26-29 are unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference, in view of the Anderson et al. reference, US Patent No.: 4,703,174, and the Mercer reference, US Patent No.: 2,499,105.

g.) Whether claims 9 and 11-15 are unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference and the DeBruin reference, in view of the Anderson et al. reference and the Mercer reference.

h.) Whether claims 24 and 26-29 are unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference, in view of the Chuang et al. reference, US Patent No.: 7,211,702, and the Camson reference.

i.) Whether claims 9 and 11-15 are unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference and the DeBruin reference, in view of the Chuang et al. reference and the Camson reference.

j.) Whether claims 24 and 26-29 are unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference, in view of the Anderson et al. reference and the Gamson reference, US Patent No.: 3,440,865.

k.) Whether claims 9 and 11-15 are unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference and the DeBruin reference, in view of the Anderson et al. reference and the Gamson reference.

7. **ARGUMENT**

a.) **Rejection of claims 1, 7, 11 and 13-15 as unpatentable under 35 U.S.C. § 112, second paragraph.**

- Claims 1, 7, 11 and 13-15

Claims 1, 7, 11 and 13-15 were improperly rejected under 35 USC 112, second paragraph, and rejection should be withdrawn.

Claim 1 was rejected as being "confusing" due to the recitation of "control unit". However, Appellant respectfully submits that recitation of "control unit" is not confusing because the language has been part of independent claim 1 since a Reply and Amendment was filed under Certificate of Mailing on October 22, 2008. Since that time, an Office Action was mailed on January 16, 2009 and did not find the language confusing because no issues were raised under 35 USC 112. Another Office Action was mailed on July 7, 2009 and, again, the language was not found confusing because no issues were raised under 35 USC 112. The language was first rejected as confusing under 35 USC 112 after the first Appeal Brief was filed on December 1, 2009 (See March 18, 2010 Office Action) in an apparent effort to bring the present case out of appeal. Appellant respectfully submits no rejections were made under 35 USC 112 in the previous Office Actions because the language was not, and is not, confusing. Claim 1 simply recites a vessel with a body and a control unit, and this simple recitation of elements would not be confusing to one of ordinary skill in the art.

Claims 7, 11 and 13-15 were rejected as being indefinite. However, the language of dependent claims 7, 11 and 13-15 has remained the same since the filing of the present application on August 21, 2006. Prior to the original appeal, the subject claims were not found indefinite through three Office Actions and years of prosecution. This lack of rejection over

multiple years and multiple actions supports Appellant's position that the language of these claims is sufficiently definite. If the claims were not definite, their examination at multiple separate occasions would not have been possible. Appellant submits the language of these dependent claims is sufficiently definite to be understood by one of ordinary skill in the art. Accordingly, Appellant respectfully requests withdrawal of the rejection under 35 USC 112, second paragraph.

b.) Rejection of claims 18, 20, 23, 25 and 30-31 as unpatentable under 35 U.S.C. § 102(b) as anticipated by the Iida et al. reference, US Patent No.: 5,356,220.

- Claims 18 and 20

Claims 18 and 20 were improperly rejected as anticipated under the Iida et al. reference, and the rejection should be withdrawn.

The Iida et al. reference discloses a method and apparatus used to monitor temperature on an iron skin surface of a blast furnace or hot air oven. (See column 1, lines 9-16). In one embodiment, an optical fiber 2 is laid on a surface of an iron skin of a hot air oven 101. The optical fiber 2 may be contained in an SUS tube inserted into guide pipes G to monitor temperature. (See column 6, lines 14-26). The temperatures along the skin are displayed and monitored. If the temperature of a measured portion of the skin exceeds an upper limit, an alarm is generated. (See column 8, lines 20-35, 45-49). In a similar embodiment, the optical fiber 2 is laid on the surface of a blast furnace body 201. If the temperature measured becomes too high, water is sprayed onto the abnormally high temperature position through an automatic water supply valve 26. (See column 9, lines 16-24, 50-66).

Accordingly, the Iida et al. reference teaches an apparatus and method for monitoring temperature and, in one embodiment, spraying water against a blast furnace to cool and preserve the blast furnace skin. However, the reference fails to disclose or teach controlling parameters in

a body based on a temperature profile. Monitoring temperature and spraying water against an outer surface of a blast furnace to cool the device may preserve the iron skin as discussed in the Iida et al. background. However, monitoring and spraying is not a disclosure or teaching related to controlling parameters in a body. Therefore, the Iida et al. reference fails to disclose elements of the subject claims.

By way of specific examples, the Iida et al. reference fails to disclose or suggest "automatically controlling parameters in the body depending on the temperature profile obtained by the distributed temperature system" as recited in independent claim 18. Claim 20 directly depends from independent claim 18 and is not anticipated by the Iida et al. reference for the reasons provided with respect to independent claim 18 and the additional subject matter recited in this dependent claim. Accordingly, the rejection of claims 18 and 20 and 35 USC 102(b) is not supported and should be withdrawn.

- Claims 23, 25 and 30-31

Claims 23, 25 and 30-31 were improperly rejected as anticipated under the Iida et al. reference, and the rejection should be withdrawn.

As discussed above, the Iida et al. reference fails to provide teachings related to controlling parameters in a body depending on a temperature profile; and claims 23, 25 and 30-31 recite additional elements related to the specific control of parameters in a body. Such control is not suggested by the Iida et al. reference which simply monitors temperature of a hot air oven or blast furnace to provide a warning or an external spray of water against skin hot spots to protect the skin. The internal processes are not controlled.

By way of example, the Iida et al. reference fails to disclose or suggest performing a process within a vessel and "automatically controlling parameters in the body" depending on a temperature profile "to ensure that the process is within an acceptable range" as recited in claim 23 and claim 25 (which depends from claim 23). Although the Iida et al. reference discloses

delivering the cooling water spray through a valve, the reference does not disclose or teach "controlling parameters *within* the body by the use of a plurality of valves" and controlling the parameters based on a temperature profile "to ensure that a process taking part *in* the body is within an acceptable range" as recited in claims 30 and 31. (*Emphasis added*) The Iida et al. reference does not discuss or teach the exercise of control over processes taking place within a body.

Accordingly, the rejection under 35 USC 102(b) also should be withdrawn with respect to claims 20, 23, 25 and 30-31.

- c.) **Rejection of claims 1-5, 10 and 16 as unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference, in view of the DeBruin reference, US Patent Application Publication No.: 2008/0312406.**

- Claims 1-5, 10 and 16

Claims 1-5, 10 and 16 were improperly rejected as obvious over the Iida et al. reference in view of the DeBruin reference. No prima facie case of obviousness has been established, and the rejection should be withdrawn.

In the March 18, 2010 Office Action, the Iida et al. reference is characterized as disclosing that "the control unit automatically controls (by automatically opening a plurality of valves to allow sprinkles to cool the body/wall) parameters/temperature in the body/wall depending on the temperature profile to ensure that the process is within an acceptable range." (See March 18, 2010 Office Action, page 4). However, Appellant disagrees with this characterization and respectfully submits the Iida et al. reference fails to make such disclosure. As discussed above, the Iida et al. reference simply describes an apparatus and method for monitoring temperatures in an iron skin of a hot air oven or blast furnace to protect that skin by spraying cooling water on hot spots, as discussed above. A discussion of this problem which reduces the life of the iron skin is provided in column 2, lines 3-8 of the Iida et al. reference.

However, the Iida et al. reference fails to disclose or teach any type of system or methodology for controlling parameters of processes within a body. As mentioned previously, the Iida et al. reference provides no description or teaching related to a distributed temperature system that monitors temperature in a body in combination with a control unit that automatically controls parameters in the body depending on the temperature profile to ensure that an internal process is within an acceptable range. Accordingly, the Iida et al. does not provide the teachings for which it is cited in the rejection of claims 1-5, 10 and 16, and the rejection under 35 USC 103(a) should be withdrawn.

A further statement is made on page 4 of the March 18, 2010 Office that the Debruin reference "states that some reactors, especially ester exchange reactors have such internals as weirs, trays, downcomers, and also need temperature control, and thus knowledge of temperature inside reactor." However, no specific reference citations were provided and Applicant was unable to find these teachings in the Debruin reference. The Debruin reference teaches employment of at least one weir along the interior surface of an esterification pipe reactor. (See page 26, paragraph 0374, and Figure 4). Additionally, the Debruin reference describes the use of a weir or weirs to control liquid levels in each pipe level of a reactor. (See page 28, paragraphs 0402-0406, and Figure 9). However, Appellant respectfully submits the reference does not disclose the other elements for which it is relied on to support the present rejection under 35 USC 103(a). Accordingly, no prima facie case of obviousness can be established and the rejection of claims 1-5, 10 and 16 should be withdrawn.

By way of specific examples, the combination of references fails to disclose, teach or suggest a distributed temperature system "comprising an optical fiber positioned in the conduit" combined with a control unit that "automatically controls parameters in the body depending on the temperature profile to ensure that the process is within an acceptable range" as recited in independent claim 1. The references further fail to disclose, teach or suggest "a tray, an outlet weir, and a downcomer positioned within the body" combined with the conduit and the optical fiber providing a temperature profile of temperatures in at least a portion of the body "containing the tray, the outlet weir and the downcomer" as also recited in independent claim 1.

Accordingly, no prima facie case of obviousness has been established and the rejection under 35 USC 103(a) should be withdrawn with respect to independent claim 1 and its dependent claims 2-5, 10 and 16.

d.) Rejection of claims 6-7 as unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference and the DeBruin reference, in view of the Hartog et al. reference, US Patent No.: 5,821,861.

- Claims 6-7

Claims 6-7 were improperly rejected as obvious over the Iida et al. reference and the DeBruin reference in view of the Hartog et al. reference. No prima facie case of obviousness has been established, and the rejection should be withdrawn.

Each of the claims 6 and 7 directly depends from independent claim 1 and recites additional elements. The Hartog et al. reference provides no additional disclosure which would obviate the deficiencies of disclosure with respect to the Iida et al. and DeBruin references as discussed above with respect to corresponding independent claim 1.

The Hartog et al. reference discloses a system for monitoring shell temperatures in a reactor. The system comprises a bundle of optical fibers 20 that are located in a tubular metal sheath 24 positioned on the outside of a shell 16. The optical fibers 20 are connected to processing equipment 28 by a fiber optic field junction box 22. (See column 2, lines 46-52). However, the processing equipment 28 is described as a control system for the optical fibers. For example, the processing means 28 comprises a laser source which launches pulses of light (See column 3, lines 1-3) used in providing the spatial resolution of the system, and the processing means 28 is described as a "reflectometry processing means 28" (See column 5, lines 23-25). Accordingly, the Hartog et al. reference also fails to disclose, teach or suggest automatic control of parameters *in* a body to ensure that a process occurring *within* is in an acceptable range based on output from a distributed temperature system. For example, the Hartog et al. reference

provides no description or teaching related to an optical fiber distributed temperature system that monitors temperature in a body in combination with a control unit that automatically controls parameters in the body depending on the temperature profile.

Even when combined, the cited references fail to disclose, teach or suggest the elements of the subject claims and no prima facie case of obviousness can be established. The rejection of claims 6-7 under 35 USC 103(a) should be withdrawn.

- e.) **Rejection of claims 21-22 as unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference, in view of the Hartog et al. reference, US Patent No.: 5,821,861.**

- Claims 21-22

Claims 21-22 were improperly rejected as obvious over the Iida et al. reference in view of the Hartog et al. reference. No prima facie case of obviousness has been established, and the rejection should be withdrawn.

Each of the claims 21 and 22 directly depends from independent claim 18 and recites additional elements. The Hartog et al. reference provides no additional disclosure which would obviate the deficiencies of disclosure with respect to the Iida et al. reference as discussed above with respect to corresponding independent claim 18.

Consequently, combination of the cited references fails to disclose, teach or suggest the elements of the subject claims and no prima facie case of obviousness can be established. The rejection of claims 21-22 under 35 USC 103(a) should be withdrawn.

- f.) **Rejection of claims 24 and 26-29 as unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference, in view of the Anderson et al. reference, US Patent No.: 4,703,174, and the Mercer reference, US Patent No.: 2,499,105.**

- Claims 24 and 26-29

Claims 24 and 26-29 were improperly rejected as obvious over the Iida et al. reference in view of the Anderson et al. reference and the Mercer reference. No prima facie case of obviousness has been established, and the rejection should be withdrawn.

As discussed above with respect to independent claim 18, the Iida et al. reference fails to disclose or suggest elements of independent claim 18 or its dependent claims. The Anderson et al. and Mercer references provide no additional disclosure that would obviate the deficiencies of the Iida et al. reference. Accordingly, the rejection under 35 USC 103(a) should be withdrawn.

Additionally, the Anderson et al. reference is relied on for the proposition that: "a fiber optic sensor for sensing both pressure and temperature could be used along with a distillation vessel." (See March 18, 2010 Office Action, page 6). However, the Anderson et al. reference instead teaches a temperature sensor 100 having a housing 102, a carrier 104, and temperature sensitive members 106. Each temperature sensitive member 106 comprises a pair of bimetallic strips that react to changes in temperature. (See column 7, lines 29-61). An optical fiber 16 is used as a communication line for carrying a light signal. When exposed to heat, the bimetallic strips bow and cause carrier 104 to move away from optical fiber 16. As a result less light is reflected back into the optical fiber from a reflective surface 112. (See column 8, lines 3-16).

Accordingly, the Anderson et al. reference fails to teach the fiber optic sensor and distillation vessel for which it is cited. In fact, the Anderson et al. reference teaches away from this approach by utilizing a conventional bimetallic sensor to detect temperature changes. Without the teachings of the present application, one of ordinary skill in the art would be led away from the approach taught and claimed in the presently pending application in which a distributed temperature sensor is formed with an optical fiber. Consequently, the cited references fail to disclose, teach or suggest the elements of the subject claims and no prima facie case of

obviousness can be established. The rejection of claims 24 and 26-29 under 35 USC 103(a) should be withdrawn.

- g.) **Rejection of claims 9 and 11-15 as unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference and the Debruin reference, in view of the Anderson et al. reference and the Mercer reference.**

- Claims 9 and 11-15

Claims 9 and 11-15 were improperly rejected as obvious over the Iida et al. reference and the Debruin reference in view of the Anderson et al. reference and the Mercer reference. No prima facie case of obviousness has been established, and the rejection should be withdrawn.

Claims 9 and 11-15 ultimately depend from independent claim 1 and recite additional elements. As discussed above with respect to independent claim 1, the Iida et al. reference and the Debruin reference fail to disclose or suggest elements of the independent claim or its dependent claims. The Anderson et al. and Mercer references provide no additional disclosure that would obviate the deficiencies of the Hartog et al. reference and the Debruin reference. As described previously, the Anderson reference also fails to provide the teachings for which it is cited in the Office Action. Accordingly, the rejection of claims 9 and 11-15 under 35 USC 103(a) should be withdrawn.

- h.) **Rejection of claims 24 and 26-29 as unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference, in view of the Chuang et al. reference, US Patent No.: 7,211,702, and the Camson reference.**

- Claims 24 and 26-29

Claims 24 and 26-29 were improperly rejected as obvious over the Iida et al. reference in view of the Chuang et al. reference and the Camson reference. No prima facie case of obviousness has been established, and the rejection should be withdrawn.

Claims 24 and 26-29 ultimately depend from independent claim 18 and recite additional elements. As discussed above with respect to independent claim 18, the Iida et al. reference fails to disclose or suggest elements of the independent claim 18 or its dependent claims. The Chuang et al. reference provides no additional disclosure that would obviate the deficiencies of the Iida et al. reference. Furthermore, Appellant did not find a patent number or other reference number associated with the cited Camson reference. Appellant therefore requests clarification as to what reference is being relied on as supporting this rejection. (In a subsequent rejection, a Gamson reference is cited with a corresponding US patent number 3,440,865, but the Gamson reference also fails to obviate the deficiencies of disclosure found in the other cited references.) Accordingly, the rejection should be withdrawn.

Furthermore, the Chuang et al. reference describes a catalytic distillation column 12 having a body 22 and an interior cavity 30. (See column 7, lines 38-40). The Chuang et al. invention is designed to provide a process by which, in part, an olefin is hydrated to produce a corresponding alcohol under mild conditions. In another aspect of the invention, a process is provided to remove water from an azeotropic mixture of an alcohol and water to allow recovery of the corresponding substantially anhydrous alcohol under mild conditions. (See column 3, lines 41-59). However, the Chuang et al. reference does not appear to describe control over temperature and pressure of a vessel by valves and automatic controllers to keep process parameters within an acceptable range, as stated in the Office Action. (See March 18, 2010 Office Action, page 8). Accordingly, the disclosure of the cited references is not sufficient to support a prima facie case of obviousness under 35 USC 103(a), and the rejection should be removed.

- i.) **Rejection of claims 9 and 11-15 as unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference and the Debruin reference, in view of the Chuang et al. reference and the Camson reference.**

- Claims 9 and 11-15

Claims 9 and 11-15 were improperly rejected as obvious over the Iida et al. reference and the Debruin reference in view of the Chuang et al. reference and the Camson reference. No prima facie case of obviousness has been established, and the rejection should be withdrawn.

Claims 9 and 11-15 ultimately depend from independent claim 1 and recite additional elements. As discussed above with respect to independent claim 1, the Iida et al. reference and the Debruin reference fail to disclose or suggest elements of the independent claim 1 or its dependent claims. The Chuang et al. reference provides no additional disclosure that would obviate the deficiencies of the Iida et al. reference and the Debruin reference. Furthermore, Appellant did not find a patent number or other reference number associated with the cited Camson reference. Accordingly, no prima facie case of obviousness can be established with respect to claims 9 and 11-15, and the rejection of claims 9 and 11-15 should be withdrawn.

- j.) **Rejection of claims 24 and 26-29 as unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference, in view of the Anderson et al. reference and the Gamson reference, US Patent No.: 3,440,865.**

- Claims 24 and 26-29

Claims 24 and 26-29 were improperly rejected as obvious over the Iida et al. reference in view of the Anderson et al. reference and the Gamson reference. No prima facie case of obviousness has been established, and the rejection should be withdrawn.

Claims 24 and 26-29 ultimately depend from independent claim 18 and recite additional elements. As discussed above with respect to independent claim 18, the Iida et al. reference fails to disclose or suggest elements of the independent claims or their dependent claims. The Anderson et al. and Gamson references provide no additional disclosure that would obviate the deficiencies of the Hartog et al. reference. Accordingly, the rejection should be withdrawn.

Furthermore, the Anderson et al. reference is again relied on for the proposition that "a fiber optic sensor for sensing pressure and temperature could be used along with a distillation vessel." (See March 18, 2010 Office Action, page 11). As described above, the Anderson et al. reference instead teaches a temperature sensor 100 having a housing 102, a carrier 104, and temperature sensitive members 106. Each temperature sensitive member 106 comprises a pair of bimetallic strips that react to changes in temperature. (See column 7, lines 29-61). An optical fiber 16 is used as a communication line for carrying a light signal. When exposed to heat, the bimetallic strips bow and cause carrier 104 to move away from optical fiber 16. As a result less light is reflected back into the optical fiber from a reflective surface 112. (See column 8, lines 3-16).

The Anderson et al. reference again fails to teach the fiber optic sensor and distillation vessel for which it is cited and teaches away from this approach by utilizing a conventional bimetallic sensor to detect temperature changes. Consequently, the cited references fail to disclose, teach or suggest elements of the subject claims and no prima facie case of obviousness can be established. Accordingly, the rejection of claims 24 and 26-29 under 35 USC 103(a) should be withdrawn.

k.) Rejection of claims 9 and 11-15 as unpatentable under 35 U.S.C. § 103(a) as obvious based on the Iida et al. reference and the Debruin reference, in view of the Anderson et al. reference and the Gamson reference.

- Claims 9 and 11-15

Claims 9 and 11-15 were improperly rejected as obvious over the Iida et al. reference and the Debruin reference in view of the Anderson et al. reference and the Gamson reference. No prima facie case of obviousness has been established, and the rejection should be withdrawn.

Claims 9 and 11-15 ultimately depend from independent claim 1 and recite additional elements. As discussed above with respect to independent claim 1, the Iida et al. and Debruin references fail to disclose or suggest elements of independent claim 1 or its dependent claims. The Anderson et al. and Gamson references provide no additional disclosure that would obviate the deficiencies of the Iida et al. reference and the Debruin reference. Furthermore, Applicant respectfully submits the Anderson et al. reference does not disclose the elements for which it is relied on to support the rejection, as discussed above. Accordingly, no prima facie case of obviousness can be established, and the rejection of claims 9 and 11-15 under 35 USC 103(a) should be withdrawn.

In view of the above remarks, Appellant respectfully submits the Examiner has provided no supportable position or evidence that any of the claims 1-7, 9-16, 18 and 20-31 is anticipated under 35 U.S.C. § 102(b) or obvious under 35 U.S.C. § 103(a). Accordingly, Appellant respectfully requests that the Board find claims 1-7, 9-16, 18 and 20-31 patentable over the art of record, withdraw all outstanding rejections, and allow claims 1-7, 9-16, 18 and 20-31.

A fee in the amount of \$540.00 was already paid at the time of filing the December 1, 2009 Appeal Brief. Accordingly, no additional fees should be necessary for filing the present Appeal Brief in furtherance of the Notice of Appeal filed on June 15, 2010. However, if the amount paid is insufficient, or if additional fees are necessary in conjunction with the present Appeal Brief, the Commissioner is authorized to charge Deposit Account No.: 500457.

Respectfully submitted,

/s/ /Robert A. Van Someren/

Date: August 7, 2010

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8. **CLAIMS APPENDIX**

1. A vessel, comprising:
a body; a conduit disposed near the body; a distributed temperature system for monitoring temperature in the body and comprising an optical fiber positioned in the conduit; a control unit; and a tray, an outlet weir, and a downcomer positioned within the body, the conduit and the optical fiber extending such that they provide a temperature profile of temperatures in at least a portion of the body containing the tray, the weir, and the downcomer, wherein a process is performed within the vessel; and the control unit automatically controls parameters in the body depending on the temperature profile to ensure that the process is within an acceptable range.
2. The vessel of claim 1, further comprising a control unit for automatically controlling parameters in the body depending on the temperature profile obtained by the distributed temperature system.
3. The vessel of claim 1, wherein the conduit is a metal conduit.
4. The vessel of claim 3, wherein the metal conduit is constructed from stainless steel.
5. The vessel of claim 1, wherein the conduit is located outside of the body.
6. The vessel of claim 1, wherein the conduit is located inside of the body.
7. The vessel of claim 1, wherein the optical fiber is pumped into the conduit by way of fluid drag.
9. The vessel of claim 1, wherein at least one of the parameters is pressure.
10. The vessel of claim 1, wherein at least one of the parameters is temperature.

11. The vessel of claim 1, wherein: the process has a plurality of stages within the vessel; and the control unit controls the parameters in the body depending on the temperature profile to ensure that each stage of the process is within an acceptable range.
12. The vessel of claim 1, wherein the vessel is part of a distillation system.
13. The vessel of claim 12, wherein the distillation system separates liquid components for subsequent processing.
14. The vessel of claim 1, wherein vapour enters the vessel at one end of the vessel and liquid enters the vessel at another end of the vessel.
15. The vessel of claim 14, wherein the vapour enters at a top end of the vessel and the liquid enters at a bottom end of the vessel.
16. The vessel of claim 1, further comprising: a plurality of valves that control parameters within the body; and the parameters are controlled depending on the temperature profile to ensure that a process taking part in the body is within an acceptable range.
18. A method for monitoring a vessel, comprising:
 - disposing a conduit near a body of the vessel;
 - monitoring temperature in the body by use of a distributed temperature system including an optical fiber that is located within the conduit;
 - extending the conduit and the optical fiber such that they provide a temperature profile of temperatures in at least a portion of the body; and
 - automatically controlling parameters in the body depending on the temperature profile obtained by the distributed temperature system.
20. The method of claim 18, wherein the disposing step comprises disposing the conduit outside of the body.

21. The method of claim 18, wherein the disposing step comprises disposing the conduit inside of the body.
22. The method of claim 18, further comprising pumping the optical fiber into the conduit by way of fluid drag.
23. The method of claim 18, further comprising: performing a process within the vessel; and automatically controlling parameters in the body depending on the temperature profile to ensure that the process is within an acceptable range.
24. The method of claim 23, wherein at least one of the parameters is pressure.
25. The method of claim 23, wherein at least one of the parameters is temperature.
26. The method of claim 23, further comprising automatically controlling the parameters depending on the temperature profile to ensure that each of a plurality of stages of the process is within an acceptable range.
27. The method of claim 18, further comprising separating liquid components in the vessel for subsequent processing.
28. The method of claim 18, further comprising feeding vapour at one end of the vessel and feeding liquid at another end of the vessel.
29. The method of claim 28, further comprising feeding vapour at a top end of the vessel and feeding liquid at a bottom end of the vessel.
30. The method of claim 18, further comprising: controlling parameters within the body by the use of a plurality of valves; and controlling the parameters depending on the temperature

profile to ensure that a process taking part in the body is within an acceptable range.

31. The method of claim 30, further comprising automatically controlling the parameters depending on the temperature profile to ensure that a process taking part in the body is within an acceptable range.

9. **EVIDENCE APPENDIX**

Not Applicable

10. **RELATED PROCEEDINGS APPENDIX**

Not Applicable